

Better Strategies for Management of Back Pain

National Center for Complementary and Alternative Medicine (NCCAM)

By any measure low back pain is a huge public health problem. It affects 1 in 4 adults, and 10 to 15 percent of patients transition from acute to chronic pain. Chronic back pain is, by far, the most frequent health problem for which Americans turn to complementary and alternative medicine (CAM). Data continue to emerge on a number of fronts suggesting that various conventional and CAM interventions may have roles to play in the management of chronic back pain.

Unfortunately, far too many patients do not improve, or experience little or no long-term relief, regardless of treatment approach and often at great cost to them and to society. It has become clear that the heterogeneity of back pain calls for multidisciplinary and integrated research strategies to better understand its pathophysiology and to develop new diagnostic and better-tailored treatment approaches.

For these and other reasons, basic, translational, and clinical research on chronic back pain has been identified as a major priority for the National Center for Complementary and Alternative Medicine (NCCAM). This brief paper highlights some of the research challenges and needs in the area of low back pain. As a component of NCCAM's ongoing strategic planning process, the paper presents a paradigm for strategic thinking about research priorities and needs in a broad area of great relevance to research on the role of CAM in treating diseases or conditions, and in improving health and well-being.

Introduction

Back pain is a common problem associated with many different conditions and diseases. Symptoms range from muscle ache to shooting or stabbing pain, limited range of motion, and/or an inability to stand straight. Back pain can be acute or chronic, and it is often recurrent with episodic flares. Chronic back pain is pain that persists for more than 3 months. The chronic condition can follow a highly variable, often waxing and waning course and response to treatment and is often progressive. In most cases cause cannot be determined. One review concluded that more than 85 percent of patients seeking care for low back pain have nonspecific pain, that is, pain that could not be attributed to a specific disease or spinal abnormality.¹ In recent years, several efforts have been made to describe the natural history of nonspecific, chronic, low back pain and to evaluate treatment and management approaches, both CAM and traditional medicine. However, current treatment strategies are inadequate, and more research is needed to understand the etiology and natural history of chronic back pain and to develop better strategies and approaches to management and care.²

¹ Van Tulder MW, Assendelft WJ, Koes BW, et al. Spinal radiographic findings and nonspecific low back pain. A systematic review of observational studies. *Spine*. 1997;22(4):427-434.

² Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Annals of Internal Medicine*. 2007;147(7):478-491.

Epidemiology, Clinical Course, and Impact

Low back pain is the fifth most common reason for physician visits in the United States, with 1 in 4 adults reporting low back pain lasting at least 1 day in a 3-month period.³ From 1997 to 2005, the percentage of people experiencing back and neck pain with resulting functional limitations was on the rise (Medical Expenditure Panel Survey).⁴

Most people experiencing acute back pain recover fully within 6 weeks and do not seek medical care. Those who do seek medical care also improve rapidly within the first month.⁵ However, up to one-third of patients experience persistent back pain of at least moderate intensity 1 year after an acute episode.⁶

The number of people receiving services related to relief from back pain has been increasing. Between 1994 and 2006, low back pain imaging usage increased 307 percent.⁷ In roughly the same period of time, opioid analgesic prescriptions for spine problems increased 108 percent.⁸ Based on 1995-2000 Medicare data, spine surgery increased 40 percent overall, spinal fusions increased 70 percent, and the use of implants increased 100 percent.⁹

Total health care costs in 1998 directly attributable to low back pain have been estimated to be \$26.3 billion.¹⁰ More recent estimates of per capita expenditures for those who have back pain show that these costs increased between 1997 through 2005.¹¹ In essence, the use of interventions is rapidly increasing, along with attendant costs for back pain—but without increased clinical benefit. Deyo et al. have expressed concern that the frequency of back pain complaints has spurred more aggressive use of diagnostic tests and treatment interventions, often pushing these tools beyond their scientifically validated indications.¹² Deyo et al. write, “Innovation has outpaced clinical science, leaving uncertainty about the efficacy and safety of many common treatments.”¹³ Although it is likely that many treatment approaches do little harm, even if little good, others—such as surgery, injection, and use of opioids—can carry significant risks and so should be used judiciously.

³ Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: Estimates from U.S. national surveys, 2002. *Spine*. 2006; 31(23): 2724-2727.

⁴ Martin BI, et al. Expenditures and health status among adults with back and neck problems. *JAMA: the Journal of the American Medical Association*. 2008;299(6):656-664.

⁵ Pengel LH, Herbert RD, Maher CG, Refshauge KM. Acute low back pain: A systematic review of its prognosis. *British Medical Journal*. 2003;327:323.

⁶ Von Korff M, Saunders K. The course of back pain in primary care. *Spine*. 1996;21:2833-2837.

⁷ Deyo RA, et al. Overtreating chronic back pain—Time to back off? *Journal of the American Board of Family Medicine*. 2009;22:62-68.

⁸ Martin BI, et al., op. cit.

⁹ Deyo RA, et al., 2009, op. cit.

¹⁰ Luo X, Pietroban R, Sun SX, Liu GG, Hey L. Estimates and patterns of direct health care expenditures among individuals with back pain in the United States. *Spine*. 2004;29:79-86.

¹¹ Martin BI, et al., op. cit.

¹² Deyo RA, et al., 2009, op. cit.

¹³ Ibid.

In addition, indirect costs related to days lost from work are substantial. Some people are severely affected, seeking chronic pain management. One study found that approximately 2 percent of the U.S. workforce is compensated for back injuries each year.¹⁴

Current Diagnosis and Treatment

There is little agreement and often controversy among providers on optimal approaches to clinical or laboratory diagnostic evaluation of chronic back pain. Furthermore, many treatment options are offered to patients seeking care or are pursued by individuals searching for self-help approaches—including opioids, injections, surgery, physical therapy, spinal manipulation, yoga, exercise therapy, acupuncture, massage, and cognitive-behavioral therapy.¹⁵ Often patients try different approaches, sometimes in consultation with a provider and sometimes on their own, searching for a strategy or combination of strategies that work, even if temporarily.

According to the Center for Disease Control and Prevention's *National Health Statistics Report #12*, 17.1 percent of adults and 6.7 percent of children use CAM for back pain.¹⁶ Current best practice guidelines from the American College of Physicians and the American Pain Society recommend that patients who do not improve with self-care should consider adding nonpharmacologic therapy with proven benefits, listing spinal manipulation for acute low back pain and numerous therapies for chronic or subacute low back pain.¹⁷

Research Efforts

Numerous clinical trials have focused on specific conventional and CAM interventions, including behavioral approaches, devices, drugs, surgery, physical or manual therapies, and acupuncture. For example, the United Kingdom Back Pain Exercise and Manipulation (UK BEAM) trial assessed the effectiveness of physical treatments for back pain in primary care.¹⁸ Subjects were randomized to arms receiving usual care, usual care plus exercise, usual care plus manipulation, and usual care plus manipulation and exercise. All groups improved over time, with the largest clinical benefit experienced by the group that had combined manipulation and exercise interventions.¹⁹ Other studies of massage, exercise, physical therapy, acupuncture, and other nonpharmacologic interventions have shown generally similar outcomes.

¹⁴ Andersson GB. Epidemiological features of chronic low-back pain. *Lancet*. 1999;354:581-585.

¹⁵ Chou R, et al., for the Clinical Efficacy Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel. Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Annals of Internal Medicine*. 2007;147:478-491.

¹⁶ Barnes PM, Bloom B, Nahin R. *CDC National Health Statistics Report #12. Complementary and Alternative Medicine Use Among Adults and Children in the United States, 2007*. December 2008.

¹⁷ Chou R, et al., op. cit.

¹⁸ UK BEAM Trial Team. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: Effectiveness of physical treatments for back pain in primary care. *British Medical Journal*. 2004;329(7479):1377.

¹⁹ Bronfort G, et al. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: A systematic review and best evidence synthesis. *Spine Journal*. 2004;4(3):335-356.

In 2007, Chou and Huffman reviewed randomized, controlled trials of nonpharmacologic therapies for low back pain.²⁰ They found that therapies with good evidence of moderate efficacy for chronic low back pain are cognitive-behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation, that is, multiple treatment approaches. However, they found “little evidence of clinically meaningful, consistent differences between most interventions found effective” (pg. 499). They also found no trials on optimal sequencing of interventions and only limited evidence that might guide choice of therapy for individual patients.

Chou and Huffman, as well as others, note consistently that it is difficult to generalize across studies and across populations in developing evidence-based recommendations for diagnostic or treatment approaches. Challenges include lack of adequate controls, differing entry criteria, inconsistent outcome measures, lack of objective outcome measures and/or reliance on self-reporting, different demographics (e.g., age, sex, mixed populations of acute and chronic sufferers), and a substantial placebo effect.

Thus, although several options exist for treatment of low back pain, it is difficult to differentiate which treatment is best for a given individual and under what conditions. There have been few large trials distinguishing between acute and chronic pain patients, and most have only followed up in the short term, although a few notable trials have examined outcomes at 1 year out. Future trials are needed to examine well-defined subgroups of patients, establish optimal “doses,” and further evaluate the cost-effectiveness of care.²¹

Deconstructing Chronic Low Back Pain: In Search of a New Research Paradigm

Researchers of chronic low back pain are in search of new and better methods, models, and approaches. A fresh perspective is needed if progress is to be made in developing comprehensive integrative management and treatment strategies that are more intelligent, efficacious, and effective. Individual studies and systematic reviews emphasize the fact that our overall understanding of the mechanisms and natural history of chronic back pain is elementary. A May 2009 NIH Workshop on Back Pain reinforced the notions that:

- chronic back pain is a symptom of multiple conditions requiring improved and more specifically targeted management strategies
- a prerequisite to more informative clinical trials in this area is a clearer understanding of the natural history of chronic back pain and its many causes.

Increased understanding of the pathophysiology of back pain will require state-of-the-art research technology applied to elucidating genetics, emotional and cognitive influences, central nervous system responses, behavior, and spinal muscle function and movement.²² With a better understanding of the natural history and pathophysiology of chronic low back pain, it should be

²⁰ Chou R, Huffman LH. Nonpharmacologic therapies for acute and chronic low back pain: A review of the evidence for an American Pain Society/American College of Physicians Clinical Practice Guideline. *Annals of Internal Medicine*. 2007;147:492-504.

²¹ Ibid.

²² Deyo RA. Back pain research: Past history, pitfalls & possibilities. NIH Workshop on Nonpharmacologic Management of Back Pain. May 27, 2009.

possible to develop more informative interventional studies that also better account for nonspecific effects (e.g., expectations, placebo, provider, and setting) and improved population stratifications. Some of these studies might be observational, others could be retrospective cohort studies; some might require randomization and controls, and others might incorporate adaptive designs. Studies will require partnerships involving both conventional and CAM providers, investigators from multiple disciplines, and health care payers.

Toward this end, NCCAM and a number of other NIH partner Institutes and Centers will convene a workshop entitled “Deconstructing Back Pain” on May 10-11, 2010. Goals of this workshop include:

- identifying the most important avenues for research needed to better understand the pathophysiology and natural history of chronic back pain
- consideration of the concept that a chronic problem may require long-term interventions and management strategies
- evaluating the utility of existing datasets and ongoing cohort studies for future natural history and effectiveness studies of chronic back pain.

Both the workshop and input received in response to this paper will inform and guide the further development of NCCAM’s strategic approach to this major public health problem.